UNESCO
SOURCES
N° 60 - JULY-AUG. 1994

SO MANY DISQUIETING SUBJECTS

Roseline Smoli-Clément
Teacher
Canaules, Gard (France)

Back in France in 1980 after teaching for 20 years in Morocco, I am continuing to study and distribute information on the problems of education here - and elsewhere.

Since the articles in your magazine can be freely reproduced, I pass them on to a number of associations with which I am in contact. These assocations concern themselves with immigrants, young people in difficulty, pollution... Disquieting subjects are very numerous alas!

ANOTHER WORLD HERITAGE

William A. Rochel Cueto
Barranquilla
(Colombia)

An amateur archivist, I am convinced of the importance of the management and preservation of documents which constitute a precious heritage for the conservation of the cultural and historic memory of the peoples of the world. I am writing to express my respect and admiration for your prestigious organization. Over the years, the importance of UNESCO's work has been recognized; and *Sources* is an indispensable means for informing a wide public about the activities which the Organization is executing or helping to carry out all over the world.

PRECIOUS INFORMATION

Rev. Alo Connaughton
Editor, FAR EAST,
Navan,
(Ireland)

I take this opportunity to congratulate you on the good work you do. We are currently preparing an article for our magazine on the overall state of primary education around the world and your dossiers on education provide us with precious information.

CONGRATULATIONS TO THE WINNERS!

Kishor Kumar Pokharel
Zoology Instruction Committee
Science Faculty,
Prithvi Narayan Campus,
Pokhara (Nepal)

I have keen interest in UNESCO Sources which provides information about different activities, such as, in your "People" column, about outstanding personalities who receive UNESCO Prizes. These people contribute to the welfare of all and should be congratulated. I would particularly like to congratulate, through you, Ms Madeleine De Vits and Young Seek, winners of the UNESCO Education for Peace Prize 1993 and Mother Teresa who won the same prize in 1992.

WHAT ABOUT BEER?

Joan Miller
Librarian
Ottawa (Canada)

Although I am not a coke drinker, I have no prejudices against the beverage. However, in reading the article on "The New Global Culture" in your excellent "Culture and Development" dossier (Sources No. 58/May 1994), it occurred to me that many other commodities, have made their way slowly and quietly (perhaps because not emanating from the dominant world power, i.e., non-American in origin), but solidly into cultures round-the-world in an even more encompassing and durable fashion.

I am thinking of other beverages like beer and champagne, Parisian fashions and French perfume, not to mention French cuisine. Yet perhaps nothing is quite so universal as the Chinese restaurant, possibly more or just as numerous in New York and Paris as indigenous eateries. And who can quite ever dethrone the Viennese Waltz and the Tango. The "new" global culture has solid old roots.

REASON TO REJOICE

Peace is celebrated in joy. In a moving ceremony at UNESCO headquarters on July 6, Israeli Prime Minister Yitzak Rabin, his foreign affairs minister Shimon Peres, and PLO leader Yasser Arafat, were presented with the 1993 Houphouet Boigny Peace Prize.

Thus hommage was paid to what Director-General Federico Mayor called "the internal force" of these three men, who, reshaping history, had brought about "the dawn of peace in the Middle East". Rarely, said Mr. Mayor, "has UNESCO - a house of concord and fraternity - had more reason to rejoice".

However, the joy that this nascent peace has given rise to, does not mask the obstacles that stand in its way and threaten its growth. "Is (the Israeli-Palestinian) agreement a genuine commitment or a tactic in a continuing struggle?" *asked the President of the award's international jury Henry Kissinger.* "The jury members were only too aware of these ambiguities." *But* "we chose to express our faith in the hopes of our honoraries, in the dreams they expressed, and not the doubts they may harbour."

"We now face the most difficult, the most perilous phase" *acknowledged Yitzhak Rabin. But the daunting task ahead has not veiled the vision of the possible.*

"We are cousins" *said Yasser Arafat,* "we must now become neighbours and friends." *For Yitzhak Rabin,* "peace will be tasted in the Palestinian coffee poured into the cups of Israeli friends" *or at the market in Gaza* "where an Israeli woman will buy her fruit from a Palestinian shopkeeper."

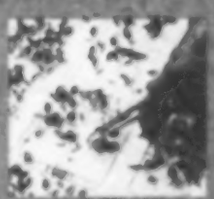
"It will be heard in the applause of Israeli audiences for the performance of a Palestinian theatre troupe, and in the jeers of the rival soccer fans when Khan Yunis plays against Tel Aviv... Peace lies in the smile of an Israeli doctor delivering a Palestinian baby, or in that of a Palestinian lifeguard toward bathers on the beach.

"That is peace."

René LEFORT

READEX
FICHE

CONTENTS



Missing species: are there yet to discover?

PAGE AND SCREEN 4
PEOPLE 5

FOCUS

Pages 6 to 16

BIODIVERSITY: NATURE IN THE BALANCE

Putting citizens in charge.

PLANET:

Symposium
• WHERE DO WE GO FROM HERE ? 18

Culture
• WHOSE HERITAGE ? 20

Education
• INTEGRATION NOT SEGREGATION 22

Environment
• CLEANING UP THE OCEANS 23

LOOKING AHEAD 24

A case of multiple identity.

Editorial and Distribution Services:UNESCO SOURCES, 7 place de Fontenoy, 75352 Paris 07 SP. Tel. (1) 45 68 16 73. Fax. (1) 40 65 00 29.
This magazine is destined for use as an information source and is not an official UNESCO document. ISSN 1014-6989.

Cover design:
© TRIPTYCE CREATION.

UNESCO SOURCES

BOOKS

THE SILK AND SPICE ROUTES: Cultures and Civilizations

For thousands of years, the Silk and Spice Routes stretched across the vast continent of Asia, linking its eastern lands with those of its west and Europe.

These trade routes were not just the means by which goods travelled; they were also channels for the migration of cultures and the growth of civilizations. Along these routes, ports and cities grew, and in the market places, people of many nationalities met to trade and exchange ideas and beliefs, expressing their cultures in the goods they sold - designs, shapes and colour - or lifestyles - their clothes, the food they ate and the religions they practised. Trading also encouraged people to employ skilled artisans - metalsmiths, weavers... from other lands which led to an exchange of technologies, styles of art and architecture. Even the performing arts were fashioned by a flow of acrobats, dancers and actors. The roots of *Commedia dell'arte*, for example, can be traced as far east as Korea. This richly illustrated book, published under UNESCO's "Integral Study of the Silk Roads: Roads of Dialogue" project, explores the process by which, along them, cultures slowly changed, amalgamated and developed.

● ***Silk and Spice Routes:*** *Cultures and Civilizations, by Struan Reid, UNESCO/Belitha Press 1994, 48 pp., 72 FF.*

COST ANALYSIS OF EDUCATIONAL INCLUSION OF MARGINALIZED POPULATIONS

Too often, attempts in education to extend social inclusion (the participation of marginal populations) have not been appropriately costed or financed with the result that programmes are either too expensive, or, on the other hand, do not have sufficient resources to provide marginalized learners with the necessary remedial or compensatory experiences. Using examples from diverse social contexts in both developing and industrialized countries, this booklet discusses methods for estimating costs of inclusion, applying cost analysis to planning and policy processes, and developing an information base for regular monitoring and analysis.

● ***Cost Analysis of Educational Inclusion of Marginalized Populations,*** *by Mun C. Tsang, Fundamentals of Educational Planning No. 48, UNESCO/IIEP 1994, 107 pp., 50 FF.*

A RICHER VISION: The Development of Ethnic Minority Media in Western Democracies

An important text for all concerned with the role of the media in multi-ethnic societies, this book assesses the sweeping changes in representation and employment of minority populations in the dominant media of the U.S., Australia, the Netherlands, France, Norway and the U.K.. Providing a review of existing literature and case studies, it addresses a wide range of subjects including: current employment, recruitment, training, and career development. It also discusses relations between the major media institutions and the independent ethnic minority media sector.

● ***A Richer Vision: The Development of Ethnic Minority Media in Western Democracies,*** *by Charles Hubbard, Ed., UNESCO/John Libbey 1994, 149 pp., 160 FF.*

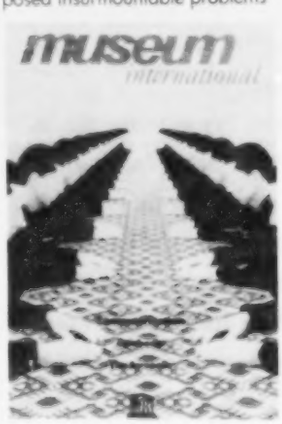
PERIODICALS

THE UNESCO COURIER

Surprising Strangers. The July-August *Courier* presents a series of articles devoted to first encounters with the Other: an author from Trinidad & Tobago whose ancestors came from India, and who now lives in Canada, discusses his *"Lost Illusions"*; Russian film director Pavel Lounguine describes his experience with the Inuits in Siberia; a Japanese anthropologist explains why he feels at home among Africans; an Indonesian Dayak pays a visit to the Korean minority in China; an African student discovers hospitality in the Ukraine; Serbian film-maker Aleksandar Petrovic talks about Gypsies; a Jewish immigrant from Poland looks at Palestinians, etc. This issue also features an interview with Chilian writer José Donoso.

MUSEUM INTERNATIONAL

Computerization. Museums have not yet achieved the computer-friendly environment that dominates the commercial world. Much time and energy were spent feeding information into computers only to find that retrieving it in usable form posed insurmountable problems



and considerable stress on staff. Nonetheless, many museums have moved ahead. One of the articles in *Museum International*'s dossier, for example, describes how the National Gallery of Canada introduced automated collections documentation with grandiose thinking and near computer illiteracy and ended with a success story based on careful planning and the development of a rational automation strategy. Other articles in this issue (No. 181) report on memorial museums in Cambodia and Australia, and the design competition for a new Acropolis museum.

RECORDS

ISLAMIC RITUAL FROM THE PROVINCE OF KOSOVO

This record presents extracts from a *zikr*, the spiritual exercise which forms the chief ceremony

ISLAMIC RITUAL FROM THE PROVINCE OF KOSOVO
RITUEL ISLAMIQUE DE LA PROVINCE DU KOSOVO
ANTHOLOGIE DES MUSIQUES TRADITIONNELLES
ANTHOLOGY OF TRADITIONAL MUSICS

of the religious brotherhoods of the dervishes which spread to Kosovo (Yugloslavia) via Macedonia when Islam was introduced there at the time of the Ottoman expansion. During the exercise the dervish intensifies his perceptions, and his body balances until he is in a state of total receptivity. The function of the music, both vocal and instrumental (percussion) is to activate the various centres in the dervish, particularly breathing which, quickened into a rhythm of a musical nature, becomes a powerful factor in controlling the mind.

● ***Islamic Ritual From the Province of Kosovo,*** *Anthology of Traditional Musics, UNESCO/AUVIDIS 1994, Cassette 85 FF, CD 145 FF.*

Publications and periodicals are on sale at the UNESCO Bookshop, or by order from UNESCO Publishing, 7 place de Fontenoy, 75352 Paris 07 SP, and in Member States through national distributors. Catalogue on request.

BRUCE McALPINE: CHANGING THE IMAGE

I thought I would be thrown to the lions at this meeting - but happily that hasn't been the case."

Bruce McAlpine's apprehension was not surprising. As spokesman for the International Association of Ancient Art Dealers, he became the first professional from this domain to take part in a session of UNESCO's Intergovernmental Committee for Promoting the Return of Cultural Property to its Countries of Origin or its Restitution in the Case of Illicit Appropriation - a body that has tended to suspect that dealers are little better than brigands and grave robbers.

(All rights reserved)

Held at UNESCO Headquarters from May 24 to 27 the Committee this time round approved a recommendation for the development of an international code of ethics for dealers. Hence the invitation to a surprised Bruce McAlpine.

"It's a very hopeful sign" he says. *"There are obviously considerable differences, but there are also areas of total agreement between the Association and the Committee. We are on the same wavelength, for example, when it comes to the destruction of monuments or theft. And indeed these are the areas where dealers can be a country's greatest allies. Our information network tends to move faster, it's more flexible, we all know each other, and if we can get information about thefts, for example, we can probably be more effective in recovery and restitution than any other organization or group. It's only logical that we be included in the debate."*

Formerly in the construction business, Bruce McAlpine switched to dealing in ancient art to follow a passion. However he is well aware that his chosen profession needs to change its *"badly tainted"*, even if *"unjustified"*, image.

His Association, which represents *"the buyer countries - western Europe, the United States and Canada"*, was set up last year to do just that. It has established its own code of ethics in which members undertake not to sell or purchase objects stolen from excavations, architectural monuments, public institutions or private property.

They also undertake to cooperate with national and international agencies in the recovery of stolen cultural property.

McAlpine is confident this will be effective and is somewhat hesitant about the idea of a code of ethics being established by authorities outside the profession.

"Our experience has always been that voluntary codes of conduct work better. To use the old English axiom, we have found that the carrot works much better than the stick, and if people self-regulate there is a much greater chance of success."

Sue WILLIAMS

MARIA LUISA DORONILA: SWING-WING LITERACY

A Philippine teacher has chosen to teach reading and writing not to all, but selectively, in marginal communities who thus gain new dignity.

(Photo UNESCO/M. Claude)

On June 24, Maria Luisa Doronila was presented with the International Award for Literacy Research for her study "Learning from Life: An Ethnographic Study of Functional Literacy in 14 Philippine Communities". The $10,000 prize, attributed by the UNESCO Institute for Education (UIE) in Hamburg (Germany) which co-finances it with the Canadian Government, was created two years ago to recompense the best research in adult education.

Ms Doronila has devoted the last 12 of her 34-year career to teaching at grassroots level. To explain her experience, she tells about her visit to *"a small ethnic community living on a beach. They were labeled 'Dumagat' (of the sea) by wholesalers who bought their 'harvest'»* she said. *"Later, I met them in the mountains where they were called 'Agta'; (of the forest). They lived by cutting rattan (cane) which they fastened into 20 bundles of 50 stems each, never making a mistake. They had a concept of numbers, and very quickly learned Arabic numerals which were very useful to them in dealing with wholesalers who had been exploiting them financially and insulting their dignity by forcing them to use their 'label' as identification."*

Wearing a blouse woven of pineapple fibers and a shimmering tube skirt - the costume of her native province - Ms Doronila told of her studies in Manila, and of the four children she raised. *"They learned to fend for themselves since I was always traveling," she said. "My aim, and that of my team of 60 was not to explain illiteracy, but to understand the life of marginal communities."*

To further complicate its task, the team had to work in eight languages, all different from the official Tagalog. Fortunately, the linguists were there.

"I realized," she added, *" that in communal, largely oral, communities, to be 'literate' was to know the lore of the tribe to meaningfully participate in the rhythm of its life. Teaching them to read and write was largely irrelevant. Similarly, in communities where development had begun, people taught themselves to be literate.*

"We must act in the middle where non-literacy is a source of shame, synonymous with poverty, low status, marginalization, and inability to participate in community life," said Ms Doronila. *"This is what we must combat so that each may gain dignity."*

She has now gone back to the beaches or the forest, near the poor, to listen and understand.

Franco BEQUETTE

● The Director-General of UNESCO, Federico Mayor, has appointed two new **ASSISTANT DIRECTORS GENERAL**: Monsieur Daniel Janicot (France), who occupied the functions of Director of the Executive Office, took up his position, on June 1, of Assistant Director-General for the Directorate.

Madame Lourdes Arizpe (Mexico) a specialist in social anthropology and formerly Vice-President of the International Social Science Council, assumed her responsabilities as Assistant Director-General for Culture on July 1. She replaces Monsieur Henri Lopes (Congo), who has been appointed Assistant Director-General of the Bureau for External Relations. The new appointments bring the number of Assistant Directors-General to seven.

BIODIVERSITY: NATURE IN THE BALANCE

Some 600 scientists, policy-makers, managers and communicators will meet at UNESCO from September 5-9 to take part in an international forum entitled Biodiversity: Science and Development - Towards a New Partnership. On top of the agenda will be how to deal with the general lack of information and knowledge regarding biodiversity, which, although the subject of an international convention adopted at the Earth Summit in 1992, remains much of a mystery for many of us.
This month's Focus attempts to answer some of the basic questions on this important issue: what biodiversity is (pp. 7,9,10), why it is important (pp. 8,11), some key facts and figures (pp. 12-13), how the scientists themselves see biodiversity and its conservation (p. 14) and how UNESCO works through its biosphere reserves to better understand and protect this vital resource (pp. 15,16).

Biodiversity - a word that has captured the world's attention. But what does it mean? One immediately thinks of a plethora of animal, plant and microbe species - the one and a half million already identified and the tens of millions as yet unknown. It also evokes the diversity within species - the different kinds of roses or breeds of dogs, the variety of faces we see in the streets reflecting the specific genetic make-up of every individual. We know too how varied are the planet's ecosystems and landscapes. Biodiversity is all around us, from genes to the biosphere.

However, biodiversity is also a cause for concern. Human activities are now endangering not only particular species but whole ecosystems. The situation is made more sensitive by the unequal distribution of biodiversity, which is richest in the South, whereas demand for access to these resources and the resulting products is strongest in the North.

"The extinction of living organisms is the most serious form of biological damage of our time, because it is totally irreversible" argues eminent entomologist Edward O. Wilson. *"Every country possesses three kinds of riches - material, cultural and biological resources...Animals and plants are part of a country's heritage; they are the result of millions of years of evolution in a particular place; they are at least as valuable as language or culture".*

To die-hard conservationists, this means every living species must be protected. Their adversaries retort that species have always died out, and that humans know how to maintain ecosystems with diminished biodiversity yet capable of ensuring their subsistance. Are not fields and plantations that harbour only a small number of species with little genetic variablility and which feed growing numbers of people clear examples of this?

ETHICS, ECOLOGY AND ECONOMICS

This oversimplified controversy is misleading because it conceals the underlying interests, and only feeds antagonism between North and South, the former being fiercely pro-conservation and the latter striving to develop and therefore interested in those resources that can be exploited.

In fact, sound biodiversity management is above all an ethical question. Protecting and maintaining our environment means respecting the rights of others: our neighbours, near and far, as well as our children and grandchildren.

Then there is the ecological justification for conservation, which is based on three facts. First, a species' long-term survival depends on genetic variability; genetic homogenization makes plants particularly susceptible to pests such as viruses, fungi or insects. In 1980, for the same reasons, 90 percent of the Cuban tobacco crop was destroyed by mildew. The same argument applies to ecosystems. In this case however, the main danger comes from human beings. Predicted climate change and the fulfilment of human needs will inevitably bring about profound changes to environmental conditions within the coming years and decades. To deal with this, we will need to fall back on nature's full ecological potential through its genes, gene complexes, species, species complexes and ecosystems. Finally, the earth functions as a whole, with each of its ecosystems and landscapes playing their part in the maintenance of such vital processes as the water, carbon or nitrogen cycles.

The economic justification for protecting biodiversity is obvious: the animals, plants and microbes that populate the planet are precious sources of food, medecine or resources necessary for society's survival.

Robert BARBAULT and Pierre LASSERRE, Director of UNESCO's Man and Biosphere Programme.

NATURE AND CULTURE

Different cultures have different visions of their surrounding environment ... and a wealth of knowledge that should not be casually dismissed.

Charaka, a well known physician of 10th century India, answering a scholar who asked him the names of useless plants in the area where Charaka lived, said in reply, *"go and ask the people of this area and give me a list of the useless plants mentioned by them"*. After two days, the scholar returned and told Charaka, *"Master, I have got my answer. There is no plant that is useless"*.

"This story" says eminent Indian biologist and former head of the World Conservation Union (UICN), M.S. Swaminathan *"exemplifies the attitude of earlier civilizations to biological wealth. The Amerindians of Guyana have a saying: 'the sky is held up by trees. If the forest disappears the sky, which is the roof of the world, collapses. Nature and man then perish together'. Lord Buddha cited the tree as a living example of the concept of unilateral love by pointing out that the tree provides shade even to the axeman who comes to cut it down. The veneration of the various manifestations of life was characteristic of all civilizations - whether they were from the north, south, east of west."*

Thus, conservation of species and ecosystem diversity has been practised in one form or another by different indigenous and rural peoples all over the world - albeit unwittingly and for reasons ranging from maintenance of food supplies and medicinal plants to reverence of nature as a source of fertility and renewal of agriculture, or simply satisfying curiousity.

FAST DISAPPEARING

"The awareness that local people have of their natural environment has been evolving over the centuries and continues to change today ... (They) obtain their ecological wisdom not only by observing nature and learning from knowledgable elders, but also by participating in productive activities such as farming, herding and gathering forest products" writes ethnobotanist Gary Martin in "Changing Perspectives on Traditional Ecological Knowledge". However, this wisdom is fast disappearing.

Industrialization, urbanization and the supermarket age have changed the vision of modern society and pushed it away from the natural environment. *"The modern world,"* argues Indian physicist and philosopher Vandana Shiva in "Monocultures of the Mind", *"has built its ideas of nature and culture on the model of the industrial factory - judging a forest, for example, on the worth of its timber rather than its life-support capacity."*

REPLANTING RICE NEAR BANGKOK (Photo UNESCO)

Similarly, she says, modern science has played its part in the disappearance of local systems of knowledge. *"The 'scientific' label assigns a kind of sacredness or social immunity to the western system. Modern science is not to be evaluated, it is merely to be accepted... (For example) in the 'scientific' system which splits forestry from agriculture and reduces forestry to timber and wood supply, food is no longer a category related to forestry. The cognitive space that relates forestry to food production, either directly, or through fertility links, is therefore erased with the split. Knowledge systems which have emerged from the food giving capacities of the forest are therefore eclipsed and finally destroyed, both through neglect and aggression."*

Yet, says Swaminathan, ample evidence shows that the botanical knowledge of hunter-gatherer societies in the past was remarkable. *"The food plants of the North American indians consisted of 1,112 species. At the time of the Spanish conquest, the Incas cultivated as many plant species as the farmers of all Asia and Europe. It has been estimated that Andean Indians domesticated over 70 separate crop species."*

Even today, says Vandana Shiva, the rainforests of South East Asia supply all the food needs of several indigenous groups in the region, who regularly exploit *"some 223 basic plant types"*. In China, nearly 6,000 of the 30,000 plant species are used for medicinal purposes. Among them is the Arteminia Annua plant which shows promise as an alternative to quinine in the treatment of malaria.

SAVIOURS OR DESTROYERS?

It is only recently that this traditional ecological knowledge has begun to be taken seriously by outsiders. Even so, they remain divided on its real value. *"Peasants have been popularly depicted as either the saviours or the destroyers of the world environment"* notes Gary Martin.

"In the most romantic view, they cultivate a Rousseauean paradise, molding their social behaviour to the natural laws of the local environment. In the most negative appraisal, they are responsible for the deforestation, shifting agriculture and erosion that endanger natural ecosystems. While new voices are proposing that traditional knowledge could hold the key to sustainable development of wildlands, other observers continue to blame peasants for the ecological destruction caused by rural overpopulation, competition for forested lands and increasing commercialization of resources in the local economy."

Nonetheless, argues Vandana Shiva, these different visions and knowledge systems held by different cultures have a vital role to play. *"The extinction of people's livelihoods and sustenance is closely connected with the erosion of biodiversity. Protection of biodiversity can only be ensured by regenerating diversity as a basis of production in agriculture, forestry and animal husbandry"* she argues. In other words, renewing the vision of different ecosystems as life-support systems, as important for people as for the species they shelter. Concludes Vandana Shiva, *"the practice of diversity is the key to its conservation."*

Sue WILLIAMS

THE BIG PICTURE

Marine biologists like Jane Lubchenco are exploring the relationship between biodiversity and ecosystem function, and coming across a lot of "surprises".

In the warm Pacific waters of the Bay of Panama is the small island of Taboguilla. It is covered by lush, diverse vegetation common to tropical islands, but its rocky shores are barren. The waters offshore are teeming with a wide variety of fish, crabs and other aquatic animals. Taboguilla's intertidal region, flooded at high tide and exposed at low tide, provides an ideal laboratory for marine ecologists Jane Lubchenco and Bruce Menge.

Lubchenco and Menge, professors of zoology from Oregon State University in the U.S., are two of many ecologists exploring the relationship between biodiversity and ecosystem function. *"We don't fully understand the connection between the two,"* Lubchenco says. *"For most systems, we don't know how many species or which ones can be lost before essential functions of the system are impaired."*

Ecosystems are geographically defined groups of organisms along with their physical surroundings. In a simplified ecosystem, plants convert sunshine into food, predators eat the plant-eaters, and microorganisms process dead matter into soil.

Healthy, functioning ecosystems have long been understood to provide many goods to society, such as food, fiber, and medicine. Recently, people have also begun to appreciate the importance and understand critical ecosystem services, such as pollinating crops and purifying water.

Appreciation increases as the high costs of degradation becomes evident. For instance, when wetlands are destroyed, the clean water and nesting sites they provided cannot easily be replaced. Even when technology exists to substitute for an ecosystem service, the costs are often too high to be practical, Lubchenco says. *"The emphasis should be shifted to preserving and maintaining what is already a functional system, as opposed to assuming that we'll be able to solve the problem later."* A particular challenge for all nations is that short-term needs often lead to a focus on harvesting goods without preserving the system's capacity to continue producing.

What are the consequences of the loss of a particular species? Ecologists have learned that certain *"keystone"* species perform unique and critical roles, and their loss results in a drastic change to the ecosystem. Other species appear to be redundant, in that their roles are shared with others in the system, and the loss of any one appears to have no short-term impact.

The sea otter is an example of a keystone species. When sea otters are removed from the kelp forest ecosystem off the Pacific coast of Alaska, the sea urchin population explodes. The urchins then consume the kelp forests, and all that remains is an "urchin barren." This case illustrates that *"the absence of a keystone predator will completely change the appearance, number of species, and functioning of the rest of the system,"* Lubchenco says. Although there are other predators, none serves the same role as the otter.

How does this loss of kelp forest affect ecosystems function? A healthy kelp forest provides food for animals in its own and adjacent systems, and protects against coastal erosion. In this case, the loss of a keystone species leads to a complete loss of function. Unfortunately, a keystone species is usually only identified when its absence results in disruption. Since such "surprises" cannot be foreseen, species loss should not be taken lightly.

NO SIGNIFICANT CHANGE

At the other end of the scale, in the intertidal area of Taboguilla, *"no one species or group of species is analogous to the keystone predator,"* says Lubchenco. *"In no case did removal result in significant change in the rest of the community."*

In one test, Lubchenco removed all the herbivorous limpets from a large, bare boulder exposed at low tide. A week later she returned at high tide and was *"absolutely astounded"* to see a lush growth of algae of different species: greens, browns, reds. *"This halo of fuzz had sprouted when the limpets were gone,"* she said. *"While I was figuring out how to quantify the growth, a school of herbivorous fish descended in a feeding frenzy, and totally wiped out what I intended to sample. It emphasized how compensation works. When the limpets weren't there to graze, other fish took over the role. That phenomenon turned out to be characteristic of all of the interactions we studied in that system."*

Functional compensation may be widespread, according to Lubchenco. Does this mean we need not worry about extinction of the limpets, as long as herbivorous fish survive? Perhaps, if each species is truly redundant. However, they probably differ in subtle ways only new ecological processes will reveal. More species may help a system recover from disasters like landslides or fires and resist normal climatic cycles. Diverse systems may adapt better to changes in atmosphere and climate. Species that seem redundant today may be our long-term insurance for healthy ecosystems of tomorrow.

Karla ALDERMAN
Corvallis, Oregon

INVISIBLE BIODIVERSITY

Microbes represent the greatest variety of life and perform unique roles. Yet, as leading expert David Hawksworth explains, we know very little about earth's microlife.

David Hawksworth has been visiting Slapton Ley Nature Reserve in south-west England since 1969. In 25 years he and his colleagues have identified some 2124 species of fungus and, even in a countryside well trodden by biologists, some 56 were new to the British Isles and 21 have been described as new to science. Each trip reveals additional fungi. *"Difficulties arise because of the minute size of species and problems of detection and identification. The number of fungi in this single site must exceed 2,500 species,"* says Hawksworth.

Slapton Ley provides just one example of how little we know of the earth's fungi, bacteria and a host of other tiny species vital to our lives. Its regular visitor, David Hawksworth, one of the world's leading experts on microbiology, is Director of the International Mycological Institute at Egham on the outskirts of London.

"There is a huge resource here that is very badly understood. Microbes represent the greatest variety of life and perform unique roles in ecological processes that cannot be accomplished by other organisms - many crucial to atmospheric composition and the circulation of nutrients. But ecologists continue to focus on the easily visible - like trees, birds and mammals - in their approaches to ecosystem function. What is required is an understanding of the microorganisms providing the fuel that drives that system," he says.

ELECTRON MICROSCOPES

Microorganisms are a very diverse concept, not a systematic group. They include algae, bacteria, fungi, protozoa and perhaps surprisingly viruses. *"Even though they are measured in nanometers and viewed through electron microscopes, viruses fulfill the definition of life with properties of multiplication, variation and heredity."* Hawksworth explains. At the other end of the microbe scale are the fungi which can produce bodies measured in meters and root systems covering square miles.

The microbial world includes the most ancient life on Earth extending back at least 3,800 million years, compared to flowering plants which have only been here for 200-300 million years. Microorganisms live in some of the most inhospitable habitats. Some exist in hot thermal pools in Yellowstone National Park at 105° C. Others photosynthesize in Antarctica, or live under the salt crusts of dried lakes in the East Africa Rift Valley.

But little is known about them. *"In the sea it has become apparent that microplankton play a key role in carbon fixing - helping to control the levels of CO_2 in the atmosphere,"* said Prof. Hawksworth. *"Some of the organisms were totally unknown until five years ago."*

Similarly microbes have a vitally important role in fixing nitrogen and other chemicals in the soil. *"Scientists in Norway recently analysed a gram of soil and found 40,000 species of bacteria. Their relationship with ecosystem process is largely unknown."*

Failure to understand can have serious consequences. *"When European brambles were introduced in Australia it was without the associated microorganisms, especially fungi, that would normally constrain their growth. As a result the brambles became huge, capable of blocking waterways,"* says Prof. Hawksworth.

Microbes can also play an important role in controlling pests, insects and even other microbes, and provide early warnings of natural calamities. *"It is now known that fungi associated with spruce forests are more susceptible to acid rain than the trees. If we had better understood this, we could have foreseen the potential damage of acid rain 15 years earlier."*

HUGE POTENTIAL

Prof. Hawksworth believes that microbes have huge potential for agriculture and medicine. *"Recently it was discovered that by interplanting nitrogen-fixing legumes in rice paddies the yield was vastly increased. One exciting project, already at the spray trial stage, uses fungi to control locusts."*

There is much interest in microbes that can digest waste to produce new foods, like the vegetarian "quorn", for humans and animals.

Scientists only recently began to understand the diversity and extent of the microworld. *"Four years ago we thought there would probably be 30,000 species of bacteria and 250,000 of fungi. New techniques provide a better estimate. We now think there are between 2 and 3 million species of bacteria and 1.5 million of fungi."*

However, only 2-5% of microorganisms have been described and named. *"The problem is the scale of the enterprise, the lack of specialists who can identify new strains, and the technology to isolate species. In the case of fungi there are four specialists in British universities capable of this work and in many countries none"*.

Prof. Hawksworth wants greater resources and better techniques to be applied to research on microorganisms. *"Consolidated international action is needed to bridge the knowledge gap in aspects crucial to ecosystem maintenance and the sustainable use of the Earth's resources.*

"We ignore, at our peril, the role of microorganisms that shaped the atmosphere, first colonised land, combined to make our cells, and mediate the key life processes of many other organisms," he says.

Paul LASHMAR
London

THE BIOLOGICAL MOTHER LODE?

Biodiversity has become a high-stakes economic actor whose value is already measured in billions of dollars.

The collection of a wild species of tomato in the Andes in 1963 resulted, after 10 generations of crossing it with the domestic species, in a marked commercial improvement valued at $8 million annually. The discovery of a virus-resistant species of wild maize in Mexico in 1979 has revolutionized cultivation of the domestic species. By the turn of the century, farm-level sales in agricultural biotechnology products such as these are expected to reach at least $10 billion and possibly as much as $100 billion annually.

As these figures show, apart from the ethical, aesthetic and scientific aspects, biodiversity is also a vital economic actor. Its dollars and cents value is immense, including that part which is not always represented in the marketplace. In Africa, for example, many domestic species providing food for rural populations are consumed directly rather than bought. In some areas of Botswana, over 50 species of wild animals provide more than 90 kg of meat per person per year (40 percent of diet) while Senegal's population of seven million eats some 400,000 tons of wild mammals and birds per year. The dollars and cents value can be worked out by estimating how much these products would sell for at market. In Sarawak, Malaysia, a 1988 field study found that wild pigs killed yearly by hunters had a market value of some $100 million per year.

APART FROM FOOD ...

But the food is not the only contribution made by wild species to national economies, particularly those of developing countries.

Total exports of wood products from Asia, Africa and South America totalled $18.4 billion in 1992. Non-wood forest products contribute more than $300m annually to the economy of Bangladesh,and provide employment for 550,000 people. In 1991 Japan produced non-wood forest products worth about $3.6 billion.

And then there are the indirect values of biological resources. In Sabah (Malaysia), for example, recent studies suggest that wild birds in silk tree plantations limit the abundance of caterpillars that would otherwise defoliate the trees.

The U.S National Marine Fisheries Service estimates that the destruction of U.S coastal estuaries between 1954 and 1978 cost the nation over $200 million annually in revenues lost from commercial and sports fisheries.

The figures are also spiralling upwards in the pharmaceutical field. One fourth of all prescriptions dispensed in the U. S. contain active ingredients from plants, and 3,000 antibiotics are derived from microorganisms. Sales from plant based drugs amounted to an estimated $15.5 billion in the U.S.A. alone in 1990. And two drugs derived from the rosy periwinkle - vincristine and vinplastine - alone earn $100 million annually for the American pharmaceutical company Eli Lilly.

Plant and animal varieties are also crucial to traditional medecine which forms the basis for primary health care for about 80 percent of the the people in developing countries.

Instead of seeking gold and diamonds, today's treasure hunters, increasingly aware of the huge commercial potential, are "biodiversity prospecting" searching for wild plant or animal material that could prove the biological "mother lode". Giants such as Merck, Glaxo, Smith-Kline, Bristol Meyrs, Shaman Pharmaceutical and the National Cancer Institute of the US, are all involved in such prospecting, and have drawn up deals that ensure a share of the profits for the host country in return for access to biological material.

Although there has been much criticism of some of these deals, they clearly indicate the commercial potential of genetic material and biochemical resources to be found in the most biodiversity rich countries, most of which are developing economies burdened by poverty and debt repayment.

At the 1992 Earth Summit in Rio, participants estimated that $3.5 billion would be needed annually to meet conservation needs in developing countries. While perhaps making an important contribution, proceeds for genetic prospecting will not be sufficient to substitute other assistance. Governments must therefore be involved, as much to encourage research and protect national interests as to prevent biodiversity destruction.

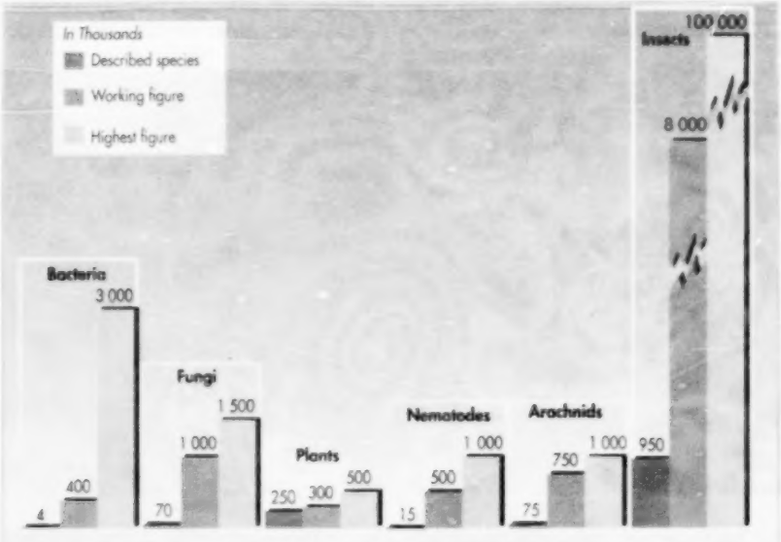
For if we can now calculate the worth of known forest products, or the different species of plants and animals upon which we rely for food, we cannot possibly calculate the value of the vast numbers of unknown species. There remains an estimated 250,000 to 750,000 plants that have not been put under the researchers' microscope, for example. Who knows what wonderful medecines or fabulous food supplies remain yet to discover, and which would benefit the whole of humanity? Can we risk losing them?

Drake McHUGH
and Manab CHAKRABORTY
(UNEP economist), Geneva

THE LIFE AND DEATH OF BIODIVERSITY

How many species live on Earth? Those we know represent only the tip of the iceberg. And now human activities risk destroying many lifeforms before we have the chance to understand their potential.

THE UNKNOWN PLANET

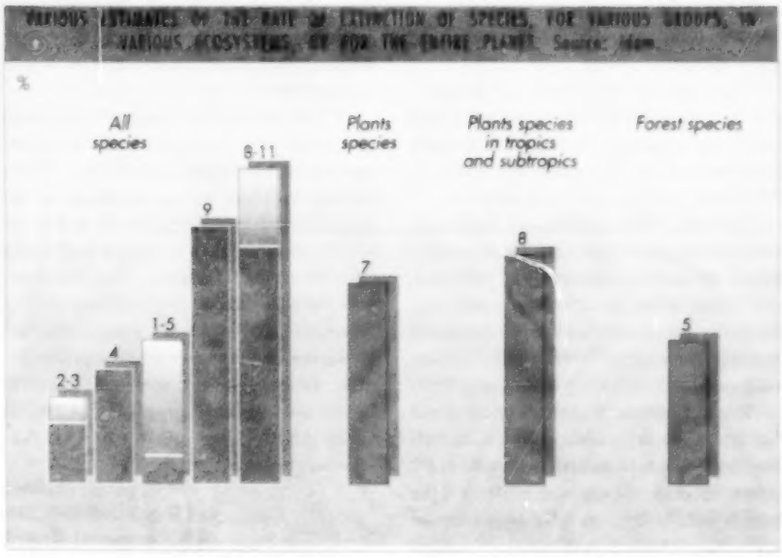


THE NUMBER OF CLASSIFIED SPECIES IN DIVERSE GROUPS OF ORGANISMS, AND THE ESTIMATES OF THOSE AS YET UNCLASSIFIED. Source: World Conservation Monitoring Centre 1992 "Global Biodiversity. Status of the Earth's Living Resources"

Our planet has been so extensively explored that it is difficult to imagine that vast numbers of life forms remain unknown to us. Yet an average of three new species of bird are discovered each year, and an estimated 40 percent of South America's fresh water fish remain to be classified. And what about those life forms of a more modest size: the insects, viruses, nematodes (worms of a sort) and the like! Who really inhabits the world's tropical forest ? A study of 19 trees in Panama, for example, turned up 1,200 species of beetle, 80 percent of which had been previously unknown to science. And what will we find in the largely unexplored ocean depths? Or simply in the soil: one gram of tropical soil for example, can contain up to 90 million bacteria and microbes.

The generally accepted *"working figure"* for the number of species on the planet is 15 million. However, some estimates have gone as high as 200 million.

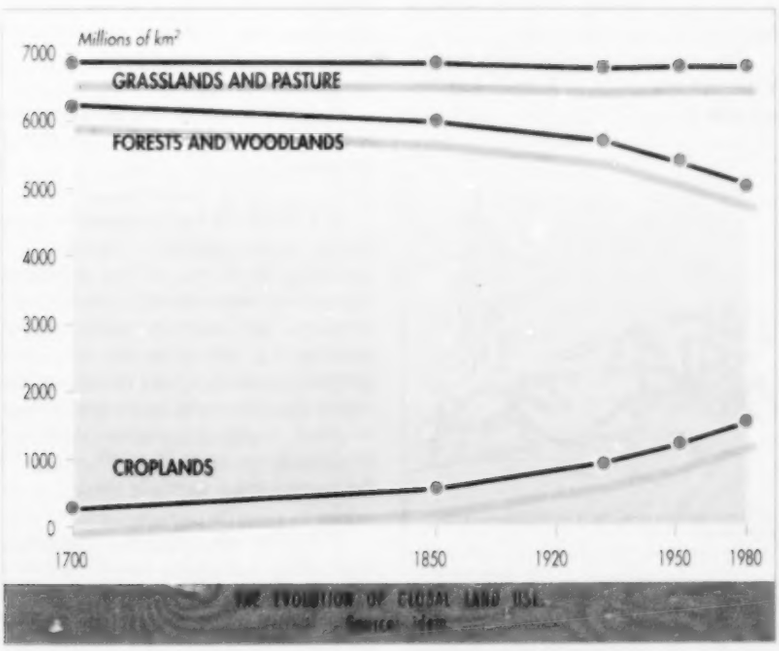
SHRINKING BIODIVERSITY



This graph, based on data from several authors, shows the estimated global percentage of species that are disappearing per decade - in terms of the total number of species, within various groups of organisms such as plants, and in particular ecological or geographical zones.

These estimations vary between one percent and 11 percent. However, because we know so little about the actual numbers and characteristics of existing species, such figures are certainly open to question.

FROM FOREST TO FIELD



THE EVOLUTION OF GLOBAL LAND USE.
Source: Idem

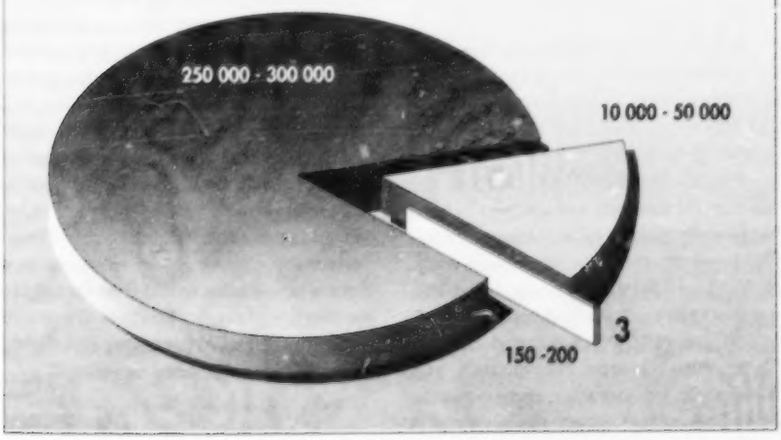
The graph opposite shows the evolution over the past three centuries of global land use, which is divided into three categories: forests and woodlands, grasslands and pasture, and croplands.

While grasslands and pasture have remained relatively stable, the area devoted to croplands has multiplied fivefold to the detriment of forest cover which has shrunk by almost one fifth.

However the forest, and especially the tropical forest, is considered as being home to the greatest range of biodiversity, including that which has already been classified and that which remains to be discovered. As habitat destruction is billed as the main cause of species extinction, changing land-use patterns are directly linked to biodiversity loss.

AN UNTAPPED TREASURE TROVE

THE PRODUCTION OF KNOWN SPECIES OF PLANTS IN HUMAN FOOD
Source: Harvesting Nature's Diversity, FAO



Of the known 10,000 to 50,000 species of edible plants, only 150 to 200 are used as human food. Nine crops only (wheat, rice, maize, barley, sorghum/millet, potato, sweet potato/yam, sugar cane and soya bean) account for more than 75 percent of the dietary energy that people derive from plants, and three (wheat, rice, maize) for more than 60 per cent.

Despite the enormous untapped reserves of edible plants, not including those that have not yet been classified, we are narrowing rather than broadening our plant food base. Commercial, uniform varieties of grain are replacing a range of traditional varieties which are dying out. The Food and Agricultural Organization (FAO) estimates that 75 percent of the genetic diversity of agricultural crops has been lost since the beginning of the century.

Infography: A. Darmon

WHAT THE EXPERTS SAY ...

Three leading scientists give their views on key biodiversity issues.

Alarmist headlines and stirring emotional campaigns to save one species or another tend to confuse the debate over biodiversity and its conservation. Even the specialists are sometimes at odds over what is fact and what is fiction.

Peter Raven from the Missouri Botanical Garden (USA), Professor Brian Huntley of South Africa's National Botanical Institute, and Professor Dan Janzen from the University of Pennsylvania - all considered as following different schools of thought, gave us their views on the conservation and exploitation of biodiversity resources.

Q.: Is it is necessary to inventory and protect all biodiversity?

P.R: As the great American conservationist Aldo Leopold once put it, *'the first rule of intelligent tinkering is to save all of the bits and pieces'*. However, with 1.4 million organisms so far identified of what I estimate to be 10 million, and with as many as a fifth of all those species likely to become extinct over the next 20 years, the notion of protecting and inventorying them all is really meaningless.

B.H.: In South Africa, protected areas cover only six percent of the land area, but afford breeding habitat for 97 percent of bird species, 92 percent of amphibian and reptile species and 93 percent of mammal species in this country. Careful selection of additional, complementary sites and adequate survey of the existing network would probably provide for conservation of all species ... within less than eight percent of its land area.

Exhaustive knowledge is certainly not a sine qua non to conservation, despite what many academics hell-bent on raising research funds might insist.

D.J: To use wildland biodiversity one needs to know what it is, where it is, how to get in to hand and sight and what are its natural history and other traits. Such an inventory needs to be applied to some degree to all wildland biodiversity and ecosystems, but not simultaneously to all wildlands and all biodiversity within them.

Q.: Is it possible to attribute a value to biodiversity?

B.H.: A cynic, according to Oscar Wilde, knows the price of everything but the value of nothing. With respect to biodiversity, we are all cynics...

The currency values of biodiversity? Whatever the value of human survival amounts to...

P.R.: The direct economic values of biodiversity are real and significant: values in crop production, medicines and so forth. The exact magnitude of these values is uncertain...(and) many of (them) are not readily capturable in the marketplace due to lack of property rights, public goods problems, open access ... For these and other reasons, too little is invested in exploring and protecting biodiversity.

D.J.: In 1993 Costa Rica earned $597 million in foreign currency from tourism and 70 percent of the tourists came because of Costa Rica's conserved wildlands. This is $300 per hectare.

When international industry pays the full cost for research and samples of wild biodiversity, pays royalties on commercialized products, and stimulates source-country biodiversity industries, that is attributing a value to wildland biodiversity ...When a wildland generates water and controls water flow, stores carbon and and biodegrades urban wastes, and is a zoo for biological control agents, that wildland is performing ecosystem services with calculable values.

When association with wildlands - biodiverse or otherwise - generates a happier and more contemplative bioliterate citizenry, urban services cost less and habitat management is cheaper in both the urban zones and the agroscape.

Q.: Will the exploitation of biodiversity prove to be a goldmine for developing countries?

D.J.:Goldmine it should never be, since mining is non-sustainable depletion of a resource. However, if the wildland biodiversity and ecosystem crop is wisely developed and honestly valued, it will prove to be a sustainable land use that is generally as much or more valuable per ha than is the present day agroscape in those tropical countries where wildland biodiversity occupies 10 to 30 percent of the country and is carefully sited.

P.R.:For developing countries, biodiversity is the stock-in-trade that they basically have to use for the development on their own productive systems and for the protection of their soils, climates, water, and other aspects of development. It is biodiversity which makes it possible for any country or region to manage itself competently and sustainably.

B.H.: The green-hype stories of miracle drugs from the forests are tantamount to fraud. That many tropical countries are being duped into believing that they are not only the custodians of massive biological wealth, but furthermore that they possess sovereign rights over the economic potential of such species, is best described as a biodiversity hoax. While there is no doubt that many products of enormous economic potential are still to be found or developed from wild sources, few of these are so localised in their distribution, or could be so rigourously controlled, as to ensure that income or royalties would flow directly to the country of origin. Biodiversity wealth is part of the global commons and should be respected and utilized as such.

Sue WILLIAMS

FROM SLASH-AND-BURN TO DEVELOPMENT

In Madagascar's Mananara-Nord Biosphere Reserve, a UNESCO project is helping preserve the forest by offering farmers alternatives to traditional methods.

How is Madagascar's biodiversity to be defended? As the headman of the village of Varara, Mr. Ravelomananjoky, notes, *"people find it simpler to clear ground, sow seeds and harvest the crops."*

Varara, a village of 1,000 people nestles in the hills 45 km southwest of the city of Mananara-Nord in the 140,000-hectare Biosphere Reserve of the same name.

The attitude Mr. Ravelomananjoky describes is a serious obstacle in any development project with no built-in protection for the environment.

The reserve, consisting of core national park areas (24,000 ha) and peripheral development zones (116,000 ha), extends from a coastal area including a coral island, reefs and mangroves, and stretching inland with marshes and humid tropical, largely virgin, forests which contain unique species of palms and orchids.

One of its features is the presence of the nocturnal Aye-Aye, the most remarkable of 28 species and 40 races of lemurs found only in Madagascar.

Of late, however, the Aye-Aye has been causing serious damage to coconut stands and provoking the discontent of the peasants by eating the young fruit. Research carried out several years ago indicates that the reason for this is that large-scale deforestation was displacing the Aye-Aye from its natural biotope.

UNDAUNTED

Although the people in the reserve show little interest in new ideas, including protecting biodiversity, the reserve's managers are undaunted. They are going ahead with a development plan based on the Man and Biosphere Programme of UNESCO, which is running the project with money from the UN Development Programme.

The first problem to sort out is the practice of itinerant farming. Slash-and-burn land use must be reduced or eradicated while ensuring that the new practices provide about 60 percent of the region's farm produce.

"It's not true to say people don't have enough farmland," says Nestor Talata, the acting director of the Mananara project. *"They should already have enough from deforested areas or lightly-wooded 'savoka' (degraded forests) zones"* - about three hectares per family.

In addition, fishermen get plenty of advice about how to protect the marine ecosystem so as to avoid threatening animal life in that part of the reserve (1,000 hectares) and its breeding grounds.

The farmers disagree strongly with both the project officials and the government. They see the forests as land to be cleared to grow rice.

"They use land extensively rather than intensively," explains Talata. But clearing land, aside from the tradition of it, is economically very important.

Local custom says land belongs to the person who clears it. *"This way we can acquire land to hand down to our children,"* says Albert Moosy, who lives in the village of Ambodirotra.

With the average family size ranging from five to 15 children, this practice is hard to give up.

THE MANANARA-NORD BIOSPHERE RESERVE COVERING 140,000 HECTARES ON THE NORTHEAST COAST OF MADAGASCAR

The problem is, as ever, how to reconcile conservation and development. How, that is, to offer the inhabitants of the reserve's peripheral development zones an alternative to their traditional farming methods, as well as a better standard of living.

The project is based on many levels of farmer participation. For example, market gardening, which many find unrewarding but still keep up. But also rice-growing, tree-planting, cattle-raising, encouraging in-shore fishing, craftwork, education and social work.

Farming methods must be improved in step with a quest for sufficient food, broadening income sources and boosting the education system.

CRAFTWORK

Craftwork has been encouraged among women to give them a new source of revenue and a means to reduce household expenditure.

The project is also backing women's groups and helping formal and informal education by setting up village libraries and improving sports facilities.

Village "forest committees" have already planted 12,000 eucalyptus trees and supervise the farmers' encroachment on the natural forests.

To encourage rice growing, 58 mini-dams have been built to irrigate 275 hectares serving 1,304 people, but there has been only a lukewarm response.

Studies have been made of how to grow some crops together, such as rice and cloves. Cattle-raising is also important in the project. No new stock has been introduced but the existing herds get generous veterinary care.

Steps have been taken to improve traditional beehives, introducing swarming and collection methods along with honey processing.

The government is concerned however with preserving the already badly-damaged natural environment. The only big forests left now are in the Antongil Bay area ansouth of Mananara, which were designated "listed forests" in 1963.

Mananara-Nord was chosen in 1988 as Madagascar's first biosphere reserve. But much remains to be done in this long-term effort to preserve a very important natural heritage.

What is now needed to complete the promising picture is promotion of eco-tourism, but this has not yet started.

Fidy ROBISON
Antananarivo

ALL ARTICLES ARE FREE OF COPYRIGHT RESTRICTIONS

A CULTURAL LANDSCAPE

The Rhön Biosphere Reserve in Germany has been altered by human hands in such a way, that its biodiversity will suffer if the human population doesn't stay.

The creation three years ago of a UNESCO Biosphere Reserve in Germany's Rhön region has provoked two kinds of reaction. Some say: *"Prospects for the natural park are very bright and that means the region's economy and people will also benefit."* Others condemn the reserve as *"a green frontier that will jeopardise future regional development"*.

The 132,000 - hectare reserve saddles the Länder (provinces) of Hesse, Bavaria and Thuringa and is home to some 90,000 inhabitants. It is unusual in that it is a clear example of a *"cultural landscape"*: a region of rolling hills, volcanic peaks and large plateaux, up to 950 metres above sea-level, once covered with woodland but which human hands have completely altered down the centuries, creating vast open spaces still intact, despite the planting of pine forests in the 1930s. Because of the prevailing natural conditions and the reluctance of local people to try modern farming methods, fine examples of traditional land use have been retained until today, preserving much of the the region's wealth of biodiversity.

But in recent decades the farmers have been leaving, pushed out by what they perceived as limited economic prospects, and their carefully cultivated lands risk becoming overgrown, which in turn poses a threat to biodiversity. The Biosphere Reserve project thus emphasizes the importance of the economic well-being of the region's human inhabitants - it's traditional ecological caretakers - as a means of protecting its natural resources.

This is where Diter Popp, of the organization Nature and the Rhön Natural Area, comes in. *"The local breed of sheep which was dying out three years ago, is becoming more and more popular in local restaurants, which are also offering increasingly regional dishes."* If this meat fetches its true price, the sheep will continue to graze, safeguard the *"open spaces"* and safeguard the reserve's biodiversity at the same time.

MORE TOURISTS

He also thinks more tourists would not disturb the animal life much. *"Tourists stay on the hiking paths. Other regions would be very proud to have what we have here in the Rhön. We need healthy tourism to maintain rural resources because it brings with it the extra money we need to run the reserve properly."*

The region's farmers, although initially very critical of the UNESCO project, are now happy with the idea that the countryside fashioned by their ancestors is being treated with such care that its resources will still be there for their grandchildren. German and European Community subsidies between 1991 and 1994 worth 2.24 million marks undoubtedly served to soften their criticism. But another important group, the forestry companies, remains sceptical. They are very annoyed about the felling of pines to preserve the colony of woodgrouse - which shrank last year from 30 to 20 - and about the creation of areas out of bounds to timber companies.

"The highlands of the Rhön have always been utilised because of their extent and their flatness" explains Ewald Sauer, project manager for the Hesse province.

He thinks there are two main things to be done: protect the great variety of genetic resources and enlarge the most unspoiled natural areas. *"Success can be gauged through certain key species"* says Sauer. *"Places where woodgrouse and other rare birds feel at home must be set aside for them."*

But these good intentions will come to nothing if farmers stop farming. The population is *"optimistically waiting"* says Fritz Steigerwald, deputy governor of the Rhön-Grabfeld region. Still, success will also require their participation. *"We need the people to climb aboard the boat instead of staying on the dockside. After all, it's they who've shaped the countryside..."*

Ulrich SCHMID
Fulda, Hesse

TO FIND OUT MORE ...

BIODIVERSITY: Problems of biodiversity loss and the means, through environmental education (EE) of getting solutions implemented. **CONNECT**, UNESCO-UNEP/EE Newsletter, December 1992.

TROPICAL FORESTS, PEOPLE AND FOOD: Biocultural Interactions and Applications to Development, C.M. Hladik, ed., Vol. 13 in the MAB Book Series, 1993, illus., 852 pp.

FOOD & NUTRITION IN THE AFRICAN RAIN FOREST, by C.M. Hladik, ed. Full of photos, drawings and maps, this study of food anthropology in the humid tropics, provides a fascinating look at life in the rain forest. UNESCO/MAB, 96 pp., 1990.

BIOTECHNOLOGIES IN DEVELOPING COUNTRIES: PRESENT & FUTURE, by Albert Sasson. An overview of the status of biotechnology R&D in the developing world, with forecasts through the end of the decade, and a discussion of economic and socio-cultural implications. UNESCO, Future-Oriented Studies, Vol. 1: Regional & National Survey, 1993, 764 pp.

BIOSPHERE RESERVES: Theory & Practice. The history and evolution of the concept with case studies analysing the major problems in the organization, zoning and management of Biosphere Reserves, and descibing various solutions. **Nature & Resources**, Vol. 29, No.1-4 1993.

BIOSPHERE RESERVES. An informative folding brochure and colour poster explaining the functions of BRs and incorporating a world map showing their location.

BIOTECHNOLOGY: The Resourceful Gene. Describes how biotechnologies can help solve some of our urgent problems - hunger, malnutrition, disease, energy, pollution, etc. **UNESCO Courier,** June 1994

APINMAP. For details on UNESCO's Asia Pacific Network for the Exchange of Information on Medicinal & Aromatic Plants (12 countries) contact: UNESCO Regional Adviser PGI/ASTINFO, GPO 967, Bangkok 10110, Thailand.

Plants that save lives

Plants form the basis of both traditional and modern medecine. Traditional Chinese medecine relies on some 5,000 plants, while in the U.S.A., some 25 percent of prescriptions are filled with drugs whose active ingredients are extracted or derived from plants. Increasing our knowledge of the plant world will certainly lead to new discoveries that will help people live better.

Catharanthus roseus (rosy periwinkle) which was first discovered in Madagascar, has shown great potential as a treatment for certain forms of leukaemia.

The bark of the Taxus brevifolia (Pacific Yew) found in the northwest Pacific provides the crucial ingredient in a "remarkably efficient" new drug being used against ovarian and breast cancer, and which has also shown promise in the treatment of lung, head and neck cancers.

From the Artemesia annua (sweet wormword, annual wormwood) "a pervasive weed" used for centuries in Chinese medecine, comes the drug Artemisinin which has proven to be particularly effective against malaria.

WHERE DO WE GO FROM HERE?

A UNESCO organized seminar attended by some of the world's leading thinkers looks at the future of "development".

● A photo exhibit devoted to **"WOMEN ON THE BANKS OF THE NILE"** was on view at UNESCO Headquarters from June 20 to July 1. The about 50 photos by Egyptian film-maker Mona Gamal El-Dine show: women doing domestic chores or crafts such as pottery and basket weaving; the *"seven days of henna"* followed by the marriage ceremony; jewelry and embroidered costumes; the children, the house, the village.

"What happened to development?" was the question asked by the some 50 specialists - economists, political observers, sociologists, poets and writers, but also those working directly in the matter, whether as leaders or activists in third world countries and shanty towns. Or in other words, what has become of what was considered *"a burning duty"*? Insofar as it is possible to summarize the participants' conclusions after two days of debate (June 18 and 19), *"development"* - or rather the strategies and actions that have come under this heading over the past 30 years - has partially or completely failed. Faced with the *"changing times"* we are living and which demand that we *"empty our minds of everything we thought we knew"* according to the French journalist, Alexandre Adler, French sociologist Edgar Morin could suggest little more than *"to seek a path in an uncharted adventure"*.

"THE MONSTER"

The introductory address by France's president, François Mitterrand, set the tone. *"I understand that someone might be a proponent of liberalism, but not of a liberalism that is intolerant, of a fundamentalist liberalism that claims to rule the world... We cannot possibly continue to produce wealth only for it to be confiscated by a minority... We can no longer put the world's development uniquely in the hands of monetary regulation."* The failure's *"bad guy"*, this bankruptcy of *"development"* - *"the monster"*, to use the ironic term of American economist, Stanley Sheinbaum - would therefore go by the name neo- or ultra-liberalism, the *"economy-first strategy"*, the completely free market, in short, the unequivocal rule of money.

One of the new exhibits in the case was a study carried out by an independent committee investigating poverty in the seven countries of the Asian sub-continent, including Bangladesh, India and Pakistan. According to its authors and other experts from the region taking part in the symposium, the policies pursued over the past fifteen years, despite a very clear increase in growth, have failed to such a point that 40 per cent of the region's population, one fifth of the planet's total, live below the poverty line. Such a figure is simply too high *"for any society to carry"* and *"puts democracy at risk"*. *"In the absence of a concerted plan of action... the numbers are likely to increase substantially."*

Other participants focused less on policy than on the players themselves. Flora Lewis, editorialist for the *New York Times*, talked about the dictatorships in the poor countries and their corruption as among the prime reasons for the *"lack of success"*, although she admitted this was not a phenomenon unique to the third world. Aminata Traoré, a "developmentalist" from Mali, agreed but added *"the self-contempt that has been instilled in us since colonial times and over the past thirty years"*.

A CHILLING ANALYSIS

Erskine Childers, former high-ranking official of the United Nations, raised the same point. His analysis was as chilling as it was merciless. Yesterday's first world became - and has remained - today's third world because of the regression subsequent to its conquest by the *"northern empires"*, then the sum of conditions that were bequeathed it upon independence and have been imposed ever since.

The following are just a few of the wounds inflicted by these empires: artificial borders, infrastructures that only served the colonial powers, ridiculous training levels; then the national, political and economic frameworks to which the third world has been obliged to conform although these frameworks are totally foreign to it; the often-repeated message that its cultures, its social organization and its technology were *"primitive"*, thus aggravating its problems without increasing its strength; in compensation for the implementation of action programmes supposedly for development, repeated and never-kept promises of aid, proof of outright dishonesty; a United Nations system steadily and voluntarily weakened.

After this indictment, certain participants called the talk by the American expert, Susan George *"apocalyptic"*. She ended with the example of Zimbabwean women who, with the structural adjustment policies imposed by the World Bank resulting in the discontinuation of free

▼ **"TO SEE AFRICA DIFFERENTLY"** was the theme of the first International African Festival of Paris, held in the French capital from June 10 to 13. Organized under the auspices of UNESCO, it presented various arts and crafts, cinema, fashion and traditional architecture of the continent. A variety of programmes and conferences enabled the public to learn more about Africa, its problems and achievements.

CITIZENS MUST BE PUT BACK INTO THE DRIVER'S SEAT (Photo UNESCO/ Inez FORBES).

schooling, have had no other choice but to prostitute themselves in order to pay for their children's tuition. *"In a market economy"*, she concluded, *"if all you have to sell is your body, that's what you do."*

It was with consummate art, considered *"defiant"* by some, that the Egyptian economist, Samir Amin, dissected the *"monster"*. Development was on the agenda for about 10 years only because of unique circumstances, i.e. the concessions won in the aftermath of the Second World War by working on capital (the welfare state), the fruits of the victory over fascism; the third world's fight and (relative) victory; and the forced march of the communist economies. Now, these three factors have been swept aside by globalization. Suddenly *"development is no longer on the menu and won't be in the years to come"*. All existing powers have only one worry, i.e. *"managing"*, *"living with"* the crisis. So salvation resides neither in the pursuit of liberalism, even less so a borderless liberalism, nor in the growing rise of chauvinistic, protectionist, even fascistic, movements. It is time to acknowledge that *"today capitalism has spent its historic effect"* and that we must *"seek beyond it"*.

Rare were the participants willing to set out in search of this beyond. Several of them emphasized that in general the situation was remarkably better than after the Second World War and cited the almost universal advances in education, health and life-expectancy. But no one seemed to be satisfied with the status quo. The "developmental" crisis is worldwide, for the same symptoms are seen everywhere. *"We are witnessing the third-worlding of the world"*, stressed the Brazilian economist, Ignacy Sachs. The deep-seated reason is that *"we no longer control anything"*, said Egyptian journalist Mohamed Sid Ahmed. And this is logical since the turnover of 15 of the world's largest multinational companies is greater than the GNP of 120 of the world's countries, pointed out an Indian intellectual, Smitu Kothari. *"By what mechanisms are the transnationals held accountable?"* he added.

And this led to the conclusion. Putting the rise of democracies to good use, *"demanded as an imperative everywhere in the world"* according to Indian economist, Nitin Desai, the economic dynamic must not be left alone to rule the world; it must be counterbalanced with ethical, political, social and legal requirements, in short, putting the citizens - of their village, country, the world - back in the driver's seat. *"Something of a cultural sort must be injected"*, said Ignacy Sachs. *"Development is not a movement of history but a policy"*, according to French sociologist, Alain Touraine. *"Development"*, asserted Aminata Traoré, *"is to conceive of oneself, assume responsibility for oneself, accept oneself."*

To do so, when they brought up the directions to take, the participants reached agreement on the same words, i.e. *"regulation"*, *"intervention"*, *"organization"*, *"coordination"*, *"contact"*, *"reciprocity"* and *"mutual concession"*... all terms that express the need of the word *"us"* in the development of societies. On the other hand these same participants acknowledged their own impotence in laying out the paths to follow. Edgar Morin quoted the Spanish poet, Antonio Machado, *"Hiker, there is no road; you must create it as you go."*

René LEFORT

●

On the occasion of **WORLD ENVIRONMENT DAY** June 5, the UNESCO Club of Libreville (Gabon) organized a three *"Save the Environment"* days (June 3 to 5). The objective of the event was to promote general awareness and develop new behaviour patterns and to make better known UNESCO's work in this domain. Supported by a wide distribution of stickers, pins and T-shirts, the event notably included a clean-up campaign, visits to factories and an operation entitled *"plant a tree"* which resulted in the planting of hundreds of seedlings. Over the same three days, UNESCO Clubs in Morocco organized a programme for *"Building awareness among the young to environmental problems"*.

▼

REDUCING THE RISKS OF NATURAL DISASTERS is not an easy job, as evidenced at the World Conference on Natural Disaster Reduction organized by the United Nations on the theme in Yokohama (Japan) from May 23 to 27. The more than 3000 participants agreed that *"awareness of the potential benefits of disaster reduction is still limited to specialized circles"*. To remedy this situation, a *"Plan of Action"* and a *"Yokohama Message"* were formulated. Both documents propose means for better management of the phenomena over which human beings have little control but whose consequences can be minimized through better preparedness.

WHOSE HERITAGE ?

The holiest shrine of the Inca civilization is at the heart of a complex problem confronting many world heritage sites.

The Temple of Luxor in Egypt, built between 1450 and 1425 BC, was originally dedicated to the *"King of Gods"* Amon-Re. After serving as headquarters for the Roman Legion, a Coptic Church was built on the site. On its foundations, in the 12th century, the church gave way to a Mosque which is still standing today.

In Spain, the Great Mosque of Cordoba, which is one of Islam's largest sacred structure, became a Christian cathedral in 1236 and still functions as such.

The problems provoked by these *"multiple identities"*, which are common to many of our great monuments, are extremely complex. Should existing structures be demolished or tampered with to reveal the ancient? The question has been raised most lately in Cuzco, Peru, the site of Koricancha, the holiest shrine of the Inca civilization.

SANTO DOMINGO ON THE KORICANCHA WALLS. (Photo Municipality of Cuzco).

Five centuries have passed since the Spanish arrived in the New World and asserted their presence by, amongst other things, building on sites worshipped over earlier centuries by the Incas. Thus, the monastery of Santo Domingo, in the centre of Cuzco, rests on the ruins of Koricancha, or Temple of the Sun - which in turn was built over remains of the pre-Inca Killke civilization.

Much of Koricancha has already been excavated. However tempers of all involved have been stirred by municipality's proposals for the site's development to create a park that would provide an unobstructural view of the monument, and to restart some excavations. The Dominicans are worried that further excavations will lead to the church's collapse and have sought legal advice on the matter.

"The monks act as if this were 1533 (the year Cuzco fell to the Spanish) retorts Raymundo Bejar, city hall's chief archaeologist and leader of a noisy minority which favours Santo Domingo's outright demolition.

At the heart of the issue is the age-old search for a compromise between Christianity and the heritage of Andean civilization. Most Cuzqueños are divided between a staunch, Catholic upbringing and a firm, if discreet, devotion to their Inca heritage. Well over half the population has Indian blood and many descendants of the mighty Andean civilizations feel slighted. The 1992 Columbus quincentennary did not still their qualms, rather fueled the push for a revival of Inca cultural identity.

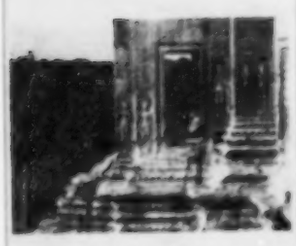
REGAINING DIGNITY

Cuzco's Mayor Daniel Estrada, for example, has won official status for the Quechua spelling (Qosqo) of the town name. Inca walls and roads are being exposed and refurbished and, in the main plaza, an anti-conquest plaque now sits squarely in front of the Jesuit church. Mayor Estrada has also erected a 40-foot statue of the Inca empire builder, Pachacuti. Although he disagrees with Bejar's opinions and maintains that the church will not be touched, he is staunchly in favour of Koricancha's development. *"After so many centuries of degradation, our society has developed a submissive and fatalistic attitude,"* he says. *"We are regaining our dignity by paying hommage to our Andean roots. Restoring Koricancha is an important part of that."*

There is also a commercial side to the Inca revival. Until last year, Shining Path terrorism and cholera dented tourism and

SAFEGUARDING AND DEVELOPMENT OF ANGKOR, an illustrated brochure, describes the history of ANGKOR and attempts to preserve its monuments, from the 19th century to the 1970s when Cambodia was plunged into war and isolated. Prepared by UNESCO for the Inter-Governmental Conference on Angkor in Tokyo last October, the 90-page report outlines efforts by national authorities, UNESCO, NGOs and a number of countries, notably France and Japan. It also provides maps and technical details.

☛ *Special Unit on Angkor*



SAFEGUARDING AND DEVELOPMENT OF ANGKOR

The first ***UNESCO CHAIR IN BIOETHICS*** is to be created at the University of Buenos Aires (Argentina) following an agreement on academic, scientific and technical cooperation signed June 6 by the Director-General of UNESCO and the Rector of the University, Oscar J. Shuberoff. The new Chair will focus on social, cultural, ethical and legal implications and facilitate access to knowledge and information in human genetic materials and molecular biology, associating other universities in the region to form a cooperative network in bioethics, particular for research on the human genome.

sent local unemployment sharply upwards. Inca ruins are judged to be a stronger tourist magnet than colonial buildings such as Santo Domingo. Together with the city of Machu Picchu, perched on a hilltop just northwest of Cuzco, a fully excavated

EXCAVATIONS AND PERSPECTIVE LOOKING TOWARDS KORICANCHA. (Photo Municipality of Cuzco).

Koricancha - so the argument goes - could make a potent one-two punch.

However, the Dominicans argue that they have already allowed extensive digging on their grounds. An earthquake in 1950 destroyed many of the Spanish walls revealing the Inca stonework for the first time in three centuries. The Church agreed not to rebuild over the walls and allowed the excavation of four chambers in the monastery courtyard, which are now open to the public.

"I respect the wisdom and beauty of Inca culture," says Reverend Domingo Gammara, Director of Santo Domingo since 1990 *"but we are all Christians now and you can't turn back time."* He accuses those who want to continue excavations of being *"treasure hunters who smell gold beneath our monastery"*.

The monks are not the only ones against further digging. Americo Carrillo, Director of the National Culture Institute (INC) in Cuzco, thinks the Inca revivalists are misguided. *"It doesn't really matter what monuments you put up or knock down because culture is in the mind,"* he says. *"Anyway, after 500 years of coexistence you can't just wipe away the presence of the Church."*

Article 11 of the International Charter for the Conservation and Restoration of Monuments and Sites, (The Charter of Venice, 1966) states that *"When a building includes the superimposed work of different periods, the revealing of the underlying state can only be justified in exceptional circumstances and when what is removed is of little interest and the material which is brought to light is of great historical, archaeological or aesthetic value, and its state of preservation good enough to justify the action."*

PARK AREA

A report prepared by American archaeologist and UNESCO consultant, Craig Morris, following a request for assistance by Mayor Estrada, commended the work already done *"providing a free view of the structures ...and opening up a park area devoted to appreciation of the monument"*.

Morris also pressed for a site museum to be integrated with the four chambers of Koricancha in the Santo Domingo complex. However, he suggested that planned excavations in the area controlled by the church *"are largely unnecessary since they were apparently done previously and covered"* (after the 1950 earthquake). Urging that the *"main Koricancha-Santo Domingo complex on church property be carefully coordinated with the park"*, Morris said it was *"absolutely essential that church officials be brought into discussions and planning"*.

He called the municipality's Project for the Valorization of Koricancha *"basically sound"*, meriting UNESCO assistance, provided an agreement be worked out between the municipality, Santo Domingo and the INC, and that a complete plan for the park be submitted to architects for approval. *"The project has great promise"* the report concludes, *"but care must be take to assure that it takes maximum advantage of the whole monument, not just the park area, and is in keeping with the highest standards for sites on the World Heritage List."*

Mayor Estrada, in an interview with *SOURCES*, said Dr. Morris' report *"coincided totally with the municipality's proposals."*

B.W. and S.W. with Carl HONORES (Cuzco)

●

The International Consultative Committee of the **SILK ROADS: ROADS OF DIALOGUE** Project met from June 14 to 18 in Athens (Greece). The 42-Member Committee, composed of archaeologists, historians, sociologists, linguists, museologists, representatives of the arts and the media, notably discussed a fifth expedition to retrace the Buddhist Route. A first segment (Nepal-India) is scheduled to take place at the end of this year, and the second (Pakistan-China) in 1995, subject to available funding. The Committee also approved a new orientation of the Project towards cultural tourism, and approved publication of an Atlas of the Silk Roads.

▼

THE NOMA CONCOURS 1994 for illustrators of children's books will grant its prizes and awards next December. Organized by the Asia/Pacific Cultural Centre for UNESCO (ACCU), it aims at promoting and developing picture books for children

in developing countries. Illustrators in Asia and the Pacific, Africa, the Arab States, Latin America and the Caribbean are invited to submit illustrations, prepared in recent years, before the November 15 deadline.

☛ *ACCU, 6, Fukuromachi, Shinjuku-ku, Tokyo 162 (Japan)*

INTEGRATION NOT SEGREGATION

Experts call for the radical reform of education for children with special needs.

Dressed in dirty rags, Fabrice, 15, used to stagger alone through neighbourhoods in Cotonou, Benin, with his arms locked over his chest. Born with a psycho-motor illness, his family considered him to be cursed by the gods.

Last year, a social worker found Fabrice and began working with his parents. Reluctantly, they agreed to place him in a school. A short time later he began to write and draw with his feet.

"His classmates admire him and want to be like him," said Constance Facia, of Benin's Directorate of Social Welfare.

This is just one of the many stories on Community-Based Rehabilitation (CBR) shared by delegates at the World Conference on Special Needs Education: Access and Quality, organized by the Spanish Government in cooperation with UNESCO. More than 300 participants representing 88 governments and 25 international organizations took part in the conference, held in Salamanca (Spain) from 7-10 June.

CBR's goal is to make individuals, families and communities responsible for the rehabilitation process, said Dr. Brian O'Toole, Director of the "Hopeful Steps" CBR programme in Guyana. This approach has been adopted and co-sponsored by UNESCO, the International Labour Organization and the World Health Organization, and is being practised in a number of countries including Benin, Ghana (see Sources No. 59),Guyana, Kenya, Mexico, the Philippines and Zimbabwe. It exemplifies the emerging consensus throughout the world that children with special educational needs should not be separated from other students. Participants in Salamanca agreed that segregation, which has been the traditional response, is often ineffective, prohibitively expensive and tends to marginalize children.

RESULTS

Although integration poses a big challenge to policy makers and educators to improve legislation, reform schools and to develop methods and curricula that are appropriate to all students, the results can be rewarding. The conference was told the story of a six year old girl in Ghana named Emo, who had never uttered a sound. She was identified as having speech and learning difficulties. Two months after being placed in a local school she started forming words like ma-ma, ba-ba and others.

Some 10 percent of all children worldwide have significant learning disabilities. The World Bank estimates that as many as 80 percent of children in the developing world are in need of special education during their primary schooling but less than one child in 100 receives it.

During the four day conference the participants examined innovations and various approaches being used in different countries, such as the CBR, to make education open to all. They appealed to governments everywhere to reform school systems to include all children regardless of learning or physical difficulties.

"As we move closer to a new century, it becomes evident that the challenge of disability has yet to be met" said Lawrence Ofori-Addo from Ghana's department of Social Welfare. *"It is however quite clear that traditional approaches can do no more than scratch the surface. A radical reappraisal of our respective roles in the rehabilitation and education of persons with disability is required."*

Constanza MONTAÑA

●

Launched in 1990 on the model of the Associated Schools Project and UNESCO Clubs, the network of **ASSOCIATED LIBRARIES** (UNAL) now counts about 130 libraries in some 50 countries. Their aim: to promote the sharing of knowledge as well as a dialogue between and among cultures to strengthen mutual understanding and peace. Two international meetings in the context of UNAL are scheduled for 1994: one in Florence (Italy) in November, on the theme of World Heritage, and another in Moscow (Russia) in December, on the theme "Libraries Without Frontiers". Any library open to the public can join the Network by contacting UNESCO's General Information Programme.

▼

Under the title ***"HIDDEN & IN NEED"*** the dossier of the current issue (No. 15) of EFA 2000, UNESCO's bulletin on Education for All, is devoted to integration with the regular school system of children "with special needs". This issue also contains an article on the education crisis in three former Soviet republics in the Caucasus: Armenia, Azerbaijan and Georgia.

CLEANING UP THE OCEANS

New Action Plan is hailed as "major initiative" in combatting the problem of marine debris in the Caribbean.

A turtle which died after swallowing a plastic bag, a dolphin which drowned after getting entangled in a discarded fishing net - such tragedies began to touch public opinion in the 1970s and produced the first international meeting on floating debris, in Brussels in 1978.

There have been many conferences and agreements since then. But it is hard to get an idea of just how much rubbish there is in the sea or scattered on beaches. It includes virtually everything, big and small, from barrels of oil to bits of plastic. It threatens the living creatures of the sea as well as the human environment. But even the strictest laws against it are difficult to enforce.

According to the U.N. Group of Experts on Scientific Aspects of Marine Pollution (GESAME), 80% of floating debris comes from the land. Sixty percent of the world's inhabitants live less than 60 km from the sea and this proportion is growing. This means the amount of domestic and industrial waste is growing too, along with shipping activity. Tourists are also responsible for a good part of the pollution. The rubbish

THIS SEAL WAS RESCUED FROM A DISCARDED FISH-NET, BUT HOW MANY OTHERS ARE ENTANGLED AND DROWNED? (Photo BIOS/ M & C. Denis-Huot).

is either thrown directly into the sea, washed into it by rains or, to a lesser extent, dropped by planes.

For centuries, there was relatively little waste floating in the sea, when you consider that oceans cover two-thirds of the earth's surface.

But for the last 25 years, plastic objects (80% of all the rubbish), spray cans, tyres and remains of fishing nets, mostly non-biodegradable, have littered beaches and dirtied the sea. According to the US National Academy of Sciences, merchant shipping, naval vessels and fishing boats dump overboard each year some 4,800,000 metal cans, 300,000 bottles, 1,200 tonnes of fishing nets and more than a million tonnes of other rubbish.

The situation is worse than it seems: a simple plastic cup has a life of 500 years and an aluminium can one of 200-300 years.

An annex to the International Convention on Marine Pollution (MARPOL), signed by 48 countries on 31 December 1988, bans all dumping of plastic material and stipulates that other waste should be discarded at a fixed distance from the shore.

In "special" areas, the dumping of any rubbish at all is banned. Since November 1990, the Intergovernmental Oceanographic Commission (IOC) of UNESCO has so classified the Gulf of Mexico and the Caribbean. But things are not as simple as that. If ships are now supposed to keep waste on board, ports must have facilities to collect and dispose of it, which is not always the case.

A regional programme, CEPPOL, launched in 1990 by the IOC and the UN Environment Programme, was supplemented this year by a "Marine Debris Waste Management Action Plan for the Caribbean" drawn up by UNESCO.

Presented at the 3rd International Conference on Marine Debris in Miami (Florida, U.S.A.) last May, it was seen as a "major initiative" in combatting the scourge and its disastrous consequences the 33 countries which border the Caribbean, and whose economies depend largely on the cleanliness and beauty of their coasts.

France BEQUETTE

●

A group of **RUSSIAN DIVING SCIENTISTS** has won the 1994 International Marine Environment Award of the World Underwater Federation. The Polar Biology Group of the P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow, were selected on June 9 and 10 by an international jury composed of members of UNESCO, its Intergovernmental Oceanographic Commission and other bodies. Recompensed for its *"courageous sub-ice research"*, the Group has collected information on polar marine environment and the relationship between biosystems and polar ice, discovering unknown biological communities that play a key role in polar marine ecosystems. The Award will be presented September 15.

▼

A training seminar for club leaders was organized for the first time since it was set up two years ago, by the Federation of ***UNESCO CLUBS OF RUSSIA*** in Moscow from May 26 to 28. After reviewing the activities and structure of the Russian clubs, and their relations with UNESCO, the World Federation and the National Commission, participants recommended that the Federation host a sub-regional meeting in 1996 on the ethical role the Clubs are called upon to play.

UNESCO SOURCES is a monthly magazine published by the *United Nations Educational, Scientific and Cultural Organization*. English and French editions are produced at Paris Headquarters; the Spanish and Catalan editions in cooperation with the UNESCO Centre of Catalonia, Mallorca 285, 08037 Barcelona, Spain; the Chinese edition in cooperation with the Xinhua News Agency, 57 Xuanwumen Xidajie, Beijing, China; the Portuguese edition in cooperation with the Portuguese National Commission for UNESCO, Avenida Infante Santo, No. 42-5°, 1300 Lisbon, Portugal.

Editor-in-Chief: R. Lefort. **Associate editors**: B. Werther, S. Williams, F. Béquette. **Assistant Managing Editor**: C. Mouillère. **Spanish edition**: E. Kouamou (Barcelona), L. Sampedro (Paris). **Lay-out**: G. Traiano, F. Ryan. **Circulation and Secretariat**: D. Moarek.

Photoengraving and printing in UNESCO Workshops. **Distribution** by UNESCO's specialized services.

LOOKING AHEAD

A new UNESCO project for the Integral Study of **THE SILK ROUTE** will be launched at an international Symposium in Samarkand (Uzbekistan) from September 1 to 3. An International Forum on **BIODIVERSITY: SCIENCE AND DEVELOPMENT** - Towards a New Partnership, will be held at Headquarters from September 5 to 9 (see dossier). UNESCO's three prizes, the Noma Literacy Prize, the International Reading Association Literacy Award and the King Sejong Prize, will be awarded on **INTERNATIONAL LITERACY DAY** September 8. A training seminar at Headquarters from September 19 to 21 will familiarize about 20 specialists in the applications of UNESCO's **IDAMS SOFTWARE PACKAGE**. A Symposium on the Main Aspects of **FICTIONAL AND POETIC CREATION IN THE ARAB WORLD** on the Threshold of the 21st Century, will take place in Carthage (Tunisia) from September 14 to 17. **INTERNATIONAL DAY OF PEACE** will be observed on September 20. The International **COMMITTEE OF BIOETHICS** will hold its 3rd meeting at Headquarters September 20 to 22. The International **COMMISSION ON EDUCATION FOR THE 21st CENTURY** will devote its 5th session in Santiago (Chile), September 26 to 30, to "Education and Citizenship". The **INTERNATIONAL CONFERENCE ON EDUCATION**, organized by the International Bureau of Education (IBE) in Geneva, October 3 to 8, will focus on "Education for Intercultural Understanding". **WOMEN & WORK** will be the theme of this year's "University for Women of the Black Sea Region" in Bucarest (Romania) from October 6 to 9. One of a series of regional workshops on **WOMEN AND MEDIA** will take place in Sofia, Yugoslavia (Bulgaria), October 7 to 13, to prepare an Asian national Symposium on the subject to coincide with and precede the International Conference on Women in Beijing.

OUR NEXT DOSSIER will focus on **BRAIN DRAIN**, its roots, extent and consequences for the countries of origin. It will also present **UNITWIN** and **UNESCO CHAIRS**, among solutions proposed by the Organization to deal with the problems created by this intellectual migration.

SOURCES